# ProTrack Scanner

Operation Manual

HUNTRON

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# HUNTRON PROTRACK SCANNER

# OPERATION MANUAL

**April 1996**
**P/N 21-1251**

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## HUNTRON INSTRUMENTS, INC.

### LIMITED WARRANTY

Huntron Instruments, Inc. believes in the quality of its products. Accordingly, Huntron provides the following non-transferable warranties for the benefit of the original end-use purchaser of the Huntron ® ProTrack Scanner instrument.

Huntron warrants that the Huntron ProTrack Scanner hardware shall be free from defects in material and workmanship for one (1) year from the date of purchase.

This warranty shall only apply to products in ordinary use. Huntron shall have no obligation under this warranty with respect to damage caused by accident, transportation, neglect, misuse, unauthorized alterations or repair, improper installation, or operating conditions.

Products purchased in the United States are to be returned to Huntron Instruments, Inc. at its factory, transportation prepaid. Products purchased outside the United States are to be returned to the source of purchase for warranty repair.

Written notice of, and an explanation of the circumstances of, any defect believed to be covered by this agreement shall be provided promptly to Huntron by the customer following discovery of the defect. In satisfaction of its warranty liability, Huntron agrees to take reasonable and prompt action to correct the defect, either by repair or replacement, at its option.

## ABOUT THIS MANUAL

This manual covers the general operation of your instrument.

## CONTACTING HUNTRON

For technical support or to obtain information about service, accessories, and other products contact:

Huntron Instruments, Inc.
15720 Mill Creek Blvd.
Mill Creek, WA 98012
U.S.A

In North America, call 800-426-9265 or 206-743-3171.

Huntron is also accessible by fax at 206-743-1360 and BBS at 206-338-3833.

Outside North America, call your local distributor for assistance or service.

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# SECTION 1
# INTRODUCTION AND SPECIFICATIONS

## 1-1. INTRODUCTION

The Huntron ProTrack Scanner, shown in Figure 1-1, has been designed as a compatible interface for the Huntron ProTrack Model 20. Together, they create an effective test system for component troubleshooting. The ProTrack Scanner allow faster comparison testing of components by the use of ZIF (zero insertion force) sockets for out of circuit components and by the use of DIP (dual inline package) clip cables for in-circuit ICs (integrated circuits).

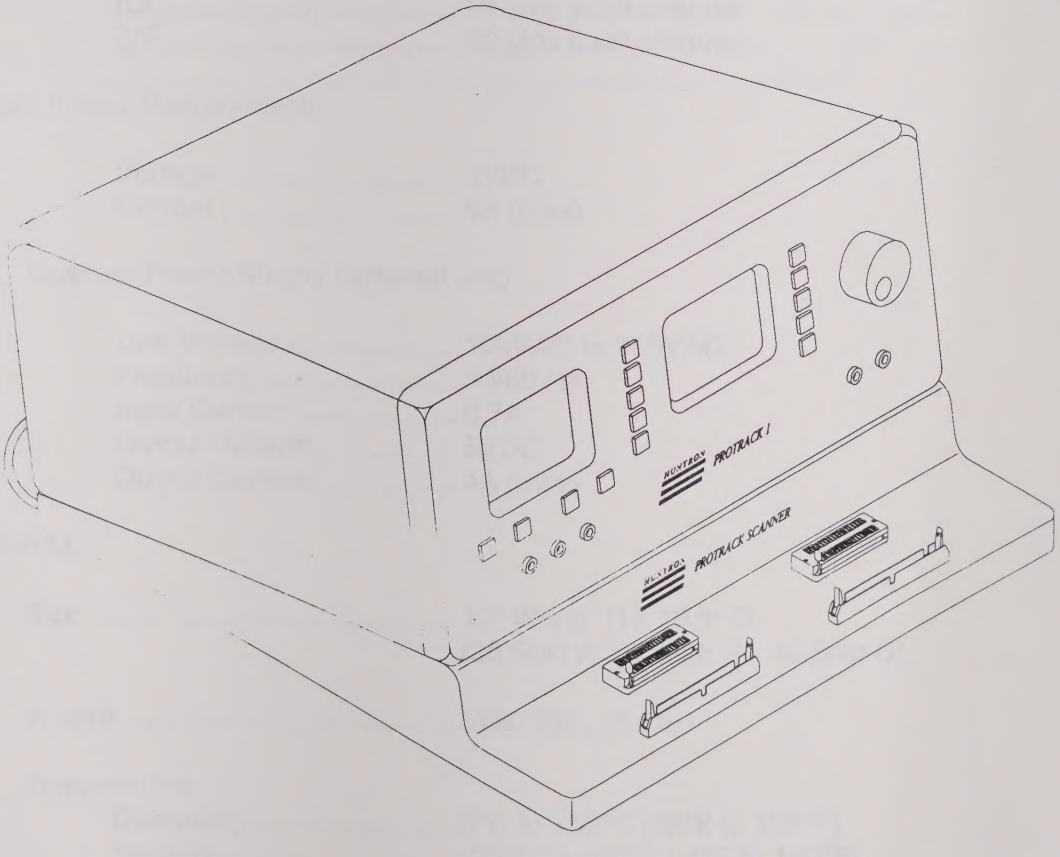



Figure 1-1. Huntron ProTrack Scanner and ProTrack I.

## 1-2. SPECIFICATIONS

The specifications for the ProTrack Scanner are listed in Table 1-1.

**Table 1-1. ProTrack Scanner Specifications.**

### ELECTRICAL

Interconnections:

Channels

Number ..... 2

Pins

Test ..... 64 per channel
Common ..... 64 per channel

Connectors

IDC ..... 64 pins each channel
ZIF ..... 40 pins each channel

Input Power Requirements

Voltage ..... 5VDC
Current ..... 4A (max)

Scanner Power Supply (external unit)

Line Voltage ..... 100VAC to 240VAC
Frequency ..... 50/60 Hz
Input Current ..... 0.7A
Output Voltage ..... 5VDC
Output Current ..... 4A (max)

### GENERAL

Size ..... 12" W x 3" H x 19.5" D
(30.5cm W x 7.6cm H x 49.5cm D)

Weight ..... 5lbs. 8oz., (2.5kg)

Temperature

Operating ..... 0°C to +50°C (32°F to 122°F)
Storage ..... -20°C to +60°C (-4°F to 140°F)

Humidity ..... 0 to 50% R.H.

## 1-3. SAFETY CONSIDERATIONS

This manual contains information, cautions, and warnings the user must follow to ensure safe operation, and to keep the instrument in a safe condition.

### WARNING

**A warning denotes a hazard. It calls attention to a procedure or practice which, if not correctly performed or adhered to, could result in personal injury.**

### CAUTION

**A caution also denotes a hazard. It calls attention to a procedure or practice which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the instrument.**

# SECTION 2
# OPERATING INSTRUCTIONS

## 2-1. INTRODUCTION

This section describes the basic operation of the ProTrack Scanner. Throughout the rest of this manual the ProTrack Scanner will be referred to simply as the Scanner. Take time to read this section carefully so that you can take full advantage of all its capabilities.

## 2-2. UNPACKING YOUR INSTRUMENT

Your instrument was shipped with the following items:

| QTY | DESCRIPTION | HUNTRON P/N |
|---|---|---|
| 1 | Operation Manual | 21-1251 |
| 2 | Clip, 8 pin | 07-1235 |
| 2 | Clip, 16 pin | 07-1229 |
| 2 | Clip, 18 pin | 07-1237 |
| 2 | Clip, 20 pin | 07-1234 |
| 2 | Clip, 24 pin | 07-1239 |
| 2 | Clip, 28 pin | 07-1240 |
| 2 | Clip, 40 pin | 07-1230 |
| 2 | Jumper Assembly 1kΩ | 98-0029 |
| 2 | Jumper Assembly 10kΩ | 98-0028 |
| 2 | Cable Assembly, 20 pin clip | 98-0103 |
| 2 | Cable Assembly, 40 pin clip | 98-0102 |
| 1 | Interface Cable RJ45 24" | 98-0173 |
| 3 | BNC Cable 24" M/M | 98-0223 |
| 1 | Scanner Power Supply | 06-6062 |
| 1 | Power Cord, USA | 98-0015 |
| | or | |
| 1 | Power Cord, European | 98-0016 |
| 1 | Static Plug Set* | 98-0256 |
| | (*included with 230V unit only) | |

Check the shipment carefully and contact the place of purchase if anything is missing or damaged in shipment. If reshipment is necessary, please use the original shipping carton and packing foam. If these are not available, be sure that adequate protection is provided to prevent damage during shipment.

## 2-3. PHYSICAL FEATURES

Before you begin to use the Scanner, please take a few minutes to familiarize yourself with the instrument. All of the externally accessible features are shown in Figure 2-1 and summarized in Table 2-1.

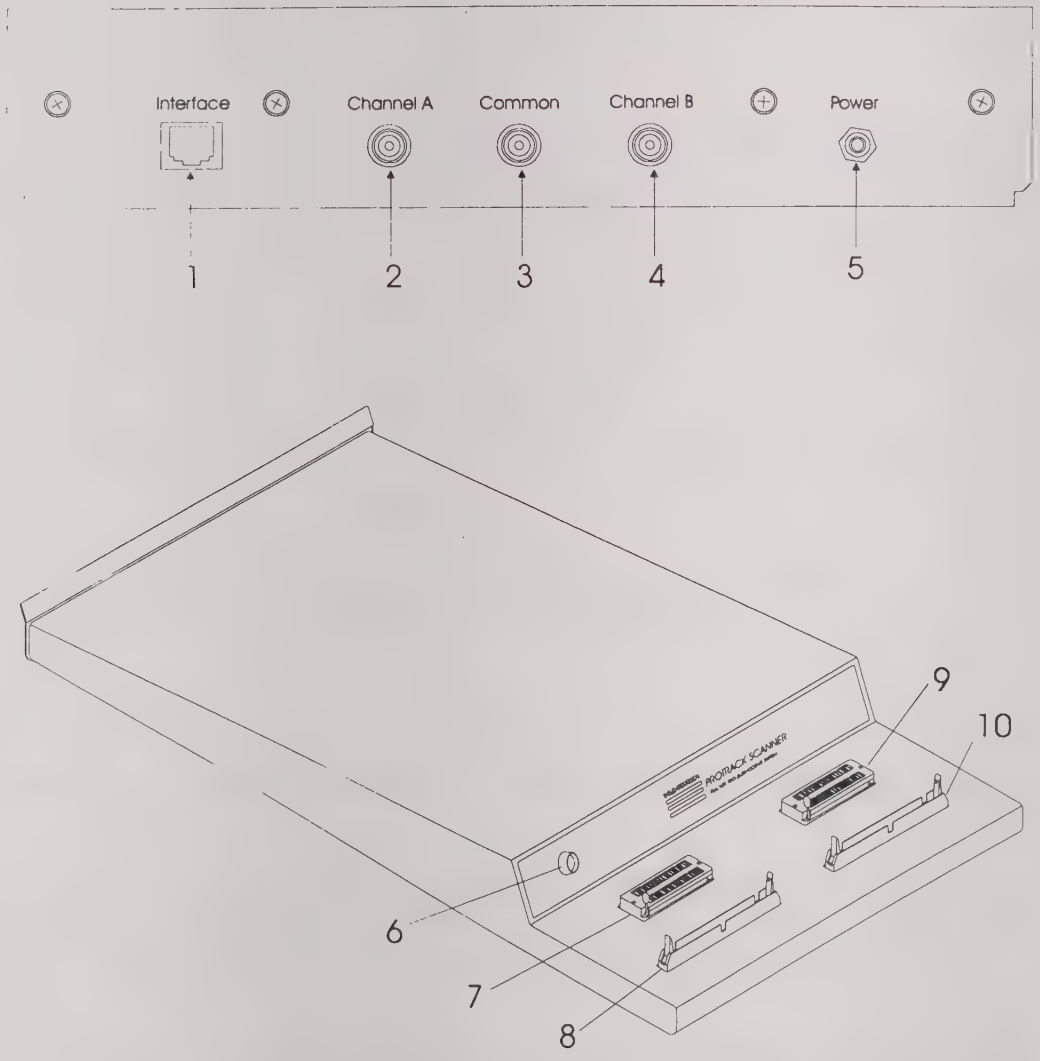



Figure 2-1. External Features

**Table 2-1. Controls and Connectors.**

| Item No. | Item | Description |
|---|---|---|
| 1 | Interface Connector | Connection to the Huntron ProTrack I Model 20. |
| 2 | Channel A BNC | Connects to Channel A BNC of the Huntron ProTrack Model 20. |
| 3 | Common BNC | Connects to the Common BNC of the Huntron ProTrack Model 20. |
| 4 | Channel B BNC | Connects to Channel B BNC of the Huntron ProTrack Model 20. |
| 5 | Power Jack | Connects to the external Scanner Power Supply. |
| 6 | Power On | Power On Indicator. |
| 7 | Channel A ZIF | 40 Pin 0.3 inch to 0.6 inch (7.62mm to 15.24mm) spacing ZIF IC socket. |
| 8 | Channel A IDC | 64 Pin IDC connector socket. |
| 9 | Channel B ZIF | 40 Pin 0.3 inch to 0.6 inch (7.62mm to 15.24mm) spacing ZIF IC socket. |
| 10 | Channel B IDC | 64 Pin IDC connector socket. |

**CAUTION**

**Use only the power supply that was included for your Scanner. Any substitution may cause damage to your Scanner.**

## 2-4. SETUP

**Note:** User should take ESD precautions (wear ground straps) before operating the unit.

The following procedure details how to setup and operate the Scanner with a ProTrack for in-circuit comparisons of a 16 pin IC on different boards. Although other modes can be used with the Scanner, this procedure is the one most commonly used for troubleshooting.

1. Connect the Interface cable supplied with your Scanner to the Scanner connector on the back panel of the ProTrack I. Connect the other end of this cable to the Interface connector located on the back of the Scanner.

2. Connect a coaxial cable from the Channel A BNC jack on the back panel of the ProTrack to the Channel A jack on the Scanner. Connect two additional coaxial cables between the ProTrack and Scanner Common and Channel B jacks.

3. Plug the external Power Supply into the Scanner Power Jack. Connect the Power cord to the external Power Supply. Plug the Power cord into the wall outlet. The Power On LED on the front of the Scanner will illuminate.

## 2-5. TYPICAL APPLICATIONS

**CAUTION**

**The devices to be tested must have all power turned off, and have all capacitors discharged before connecting the Scanner to the devices.**

This section shows a typical application of the Scanner using DIP IC test clips to access components. Using DIP test clips to access a multi-pin component is more convenient than using a single test probe manually to access IC pins one at a time. Follow the general steps below to setup your Scanner when using DIP clips for testing.

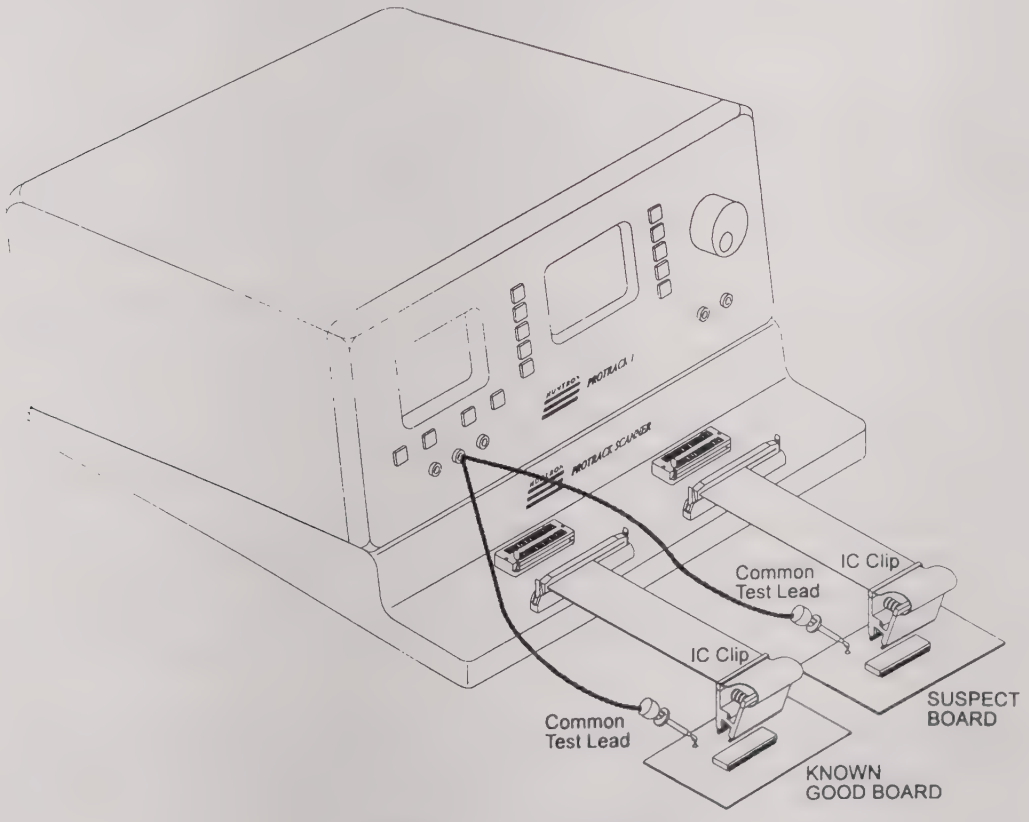



Figure 2-5. Typical Application

1. Connect the two 20 pin DIP clip cables to the two 64 pin IDC sockets on the Scanner. Attach 16 pin DIP clips to the ends of the cables.

2. Connect the DIP clip end of the left cable to a 16 pin IC on a known-good board. The red stripe end of the clip is pin 1 so be sure that end of the clip is connected to pin 1 of the IC.

3. Connect the DIP clip end of the right cable to the 16 pin IC that is in the same location on the unknown board as the IC on the known-good board (i.e. if you hooked up to U8 or IC9 on one board, hook up to U9 or IC9 on the other board).

4. Connect the Common test lead from the ProTrack I to the same common point on each board. You can also set common pins using the ProTrack I (refer to the ProTrack I manual). In this case you do not need to connect to the common of each board using the common test leads from the ProTrack's common front panel jack. The common is routed through the Scanner's internal relays and out the 64 pin IDC cables.

The topics that follow clarify various points and expand into other areas.

**CIRCUIT SIMILARITY** - Devices and circuits being compared should be as nearly identical as possible, otherwise differences may be present which could give misleading signatures. Try to use the same PCB revision level when comparing boards or verify by schematic diagram that the device being examined is wired the same on boards of different revision level.

**SELECTING COMMON PINS** - In theory any pin on an IC that is not an open circuit could be used for the common pin. In practice, however, the normal procedure is to use one of the power supply pins on an IC as the common pin. $V_{SS}$, $V_{DD}$, $V_{CC}$, and Ground are some typical names for power supply pins. There is one situation where it is sometimes useful to not use a power supply pin. When testing boards where bus architectures are in use, most of the pins on one IC will be connected in parallel with the same pins on other devices. Using the normal procedure above you can see a fault on one bus line, but you do not know which IC is causing it since they are all in parallel. In this event try using one of the "non-bussed" pins on the IC as the common pin. A non-bussed pin is any one that is not connected in parallel with all other ICs. Examples include "Chip Select" and "Enable" lines.

**OUT OF CIRCUIT COMPONENTS** - When comparing ICs that are not soldered in a board, place the components directly into the ZIF sockets and do not use the DIP clips. Then follow all the other steps of the procedure in the normal manner.

**NON-COMPARISON TESTING** - When you want to examine the signatures of only one board, connect the appropriate cable to the board.

**TESTING CMOS DEVICES** - CMOS ICs sometimes produce unstable signatures especially when tested out of circuit in the ZIF sockets of the Scanner. Whether the device is in-circuit or out of circuit, if instability occurs it is advisable to connect the 10kΩ resistor jumpers provided across the $V_{DD}$ and $V_{SS}$ pins of the device. This will help to reduce or eliminate the unstable signatures. To use the resistor jumpers, select $V_{DD}$ or $V_{SS}$ as the common pin in the normal manner or use common leads.

## 2-5. EXTERNAL CLEANING

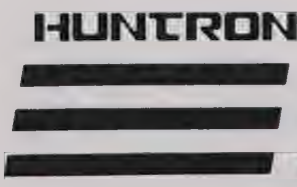
### CAUTION

**To avoid instrument damage, never get water inside the case or apply solvents to the instrument.**

Should the Scanner case require cleaning, wipe the instrument with a cloth that is lightly dampened with water or mild detergent solution.

## 2-6. STORAGE INSTRUCTIONS

For optimum protection, store unit indoors in a dry place.

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**CHANGE INFORMATION**
**P/N: 21-1292**
**ISSUE NO: 2 1/98**

This change contains information necessary to ensure the accuracy of the following manual:

| | |
|---|---|
| Title: | **HUNTRON PROTRACK SCANNER OPERATION MANUAL** |
| Print date: | **April 1996** |
| P/N: | **21-1251** |
| Revision: | **0** |
| Revision Date: | **--/--** |

**CHANGE #1**

EFFECTIVITY: 340-01121

**THROUGHOUT THE MANUAL**

Replace "Scanner" with "Scanner I."

**ON PAGE 1-2**

In Table 1-1, "ProTrack Scanner Specifications," delete the temperature and humidity specifications under "GENERAL" and add the following two headings:

**ENVIRONMENTAL**

| | |
|---|---|
| Indoor Use | |
| Altitude | <2000m (<6560') |
| Temperature | |
| Operating | 0°C to +40°C (32°F to 104°F) |
| Storage | -20°C to +60°C (-4°F to 140°F) |
| Relative Humidity | 0 to 80% from 0°C to 31°C (32°F to 88°F)<br>Maximum R.H. decreases linearly to 50% at 40°C |

**SAFETY** According to IEC1010-1

| | |
|---|---|
| OverVoltage Category | |
| Ext. Power Supply | CAT II |
| Scanner | CAT I |
| Pollution Degree | 2 |

CHANGE #1 (continued)

ON PAGE 1-3

Replace existing section 1-3 with the following new section:

## 1-3 SAFETY CONSIDERATIONS

### Safety Terms and Symbols

**Terms in this Manual.** These terms may appear in this manual:

**⚠ WARNING**

**Warning statements identify conditions or practices that could result in injury or loss of life.**

**⚠ CAUTION**

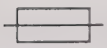
**Caution statements identify conditions or practices that could result in damage to this product or other property.**

**Symbols on the Instrument.** These symbols may appear on the instrument:

Earth Terminal

Protective Ground (Earth) Terminal

CAUTION Refer to Manual


Fuse

Review the following safety precautions to avoid injury and prevent damage to this instrument. The user shall be made aware that, if the instrument is used in a manner not specified by the manufacturer, the protection provided by the instrument may be impaired.

*Only qualified personnel should perform service procedures.*

TO AVOID FIRE OR PERSONAL INJURY

**Use Proper Power Cord.** Use only the power cord certified for the country of use.

⚠ **WARNING**

**The detachable power cord is the means with which to disconnect the instrument from the mains voltage supply. Therefore do not position the external power supply and power cord so that it is difficult to pull the power cord out of the power supply.**

**Ground the Instrument.** Before any other connection is made, the instrument must be connected to a protective earth conductor via the three-wire power cable. The power plug shall be inserted only into a grounded outlet. Do not defeat the protective action by using an extension cord without a grounded connector.

⚠ **WARNING**

**Any interruption of the protective ground conductor inside or outside the instrument or disconnection of the protective ground terminal is likely to make the instrument dangerous. Intentional interruption is prohibited.**

**Do Not Operate Without Covers.** Do not operate this instrument with covers or panels removed.

**Avoid Exposed Circuitry.** Do not touch exposed connections and components when power is present.

**Do Not Operate With Suspected Failures.** If you suspect there is damage to this instrument, have it inspected by qualified service personnel.

**Do Not Operate in Wet/Damp Conditions.**

**Do Not Operate in an Explosive Atmosphere.**

**Keep Product Surfaces Clean and Dry.**

**CHANGE #1 (Continued)**

**ON PAGE 2-1**

In Section 2-2 "UNPACKING YOUR INSTRUMENT":

Delete the text (***included with 230V unit only**) which refers to the "Static Plug Set - P/N #98-0256."

**ON PAGE 2-3**

Replace the caution note with the following:

> ⚠ **CAUTION - POWER ADAPTER**
>
> **Use only the PHIHONG power supply (Model PSA-30U-050) that was included with your Scanner I. Any substitution may damage your instrument and/or result in an unsafe condition.**

Also add the following text to Section 2-3:

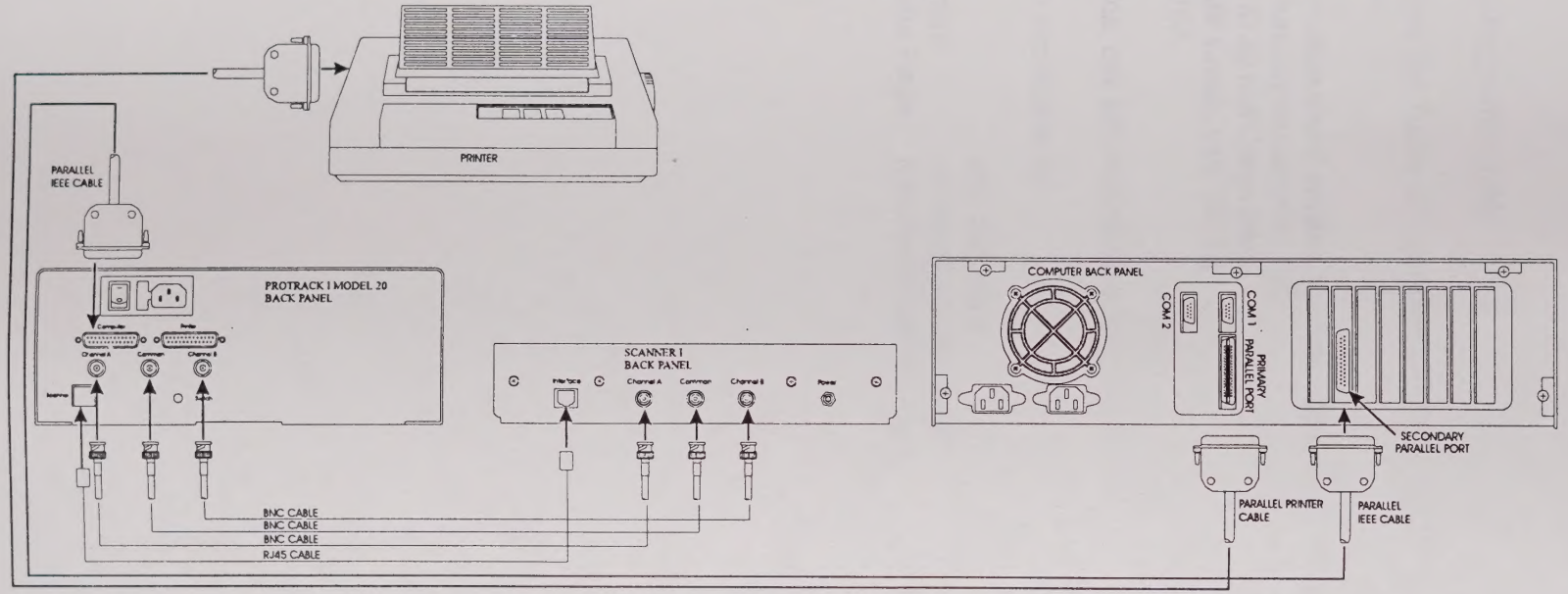
Refer to the following diagram (see page 5) to connect the ProTrack Scanner I to a ProTrack I Model 20.

**ON PAGE 2-4**

Replace the caution note with the following:

> ⚠ **CAUTION**
>
> **The device to be tested must have all power turned off, and have all high voltage capacitors discharged before connecting the Scanner I to the device.**

## *ProTrack I Model 20/Scanner I/Computer Connections*




# CABLE HOOKUP USING THE SECONDARY COMPUTER PARALLEL PORT

PROTRACK I MODEL 20 TO SCANNER I & COMPUTER/PRINTER TO COMPUTER

**CHANGE #2**

EFFECTIVITY: 1/98

On Page before the Table of Contents change the CONTACTING HUNTRON information to:

To obtain information about service, accessories and other products, contact:

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Mill Creek, WA 98012
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